

rocky soil comes up from the adjoining mountains which bound Scinde on the north. All is bare, no trees and no surface vegetation, but great abundance of the *Euphorbia nereifolia*, which, like a *Cactus*, fleshy and leafless, spreads its whitened stems and withered stumps in patches as large as a small haystack. There are a few gardens in which grow tamarinds, mangoes, bheres (*Zizyphus vulgaris*), and the date-palm (*Phoenix sylvestris*) springs up wild in every compound. However, Sir Charles Napier is doing great things; has planted rows of young trees over all the avenues and streets; and has formed a capital Government garden, which is a depôt for garden shrubs, and supplies the troops with fresh European vegetables. The favourite garden shrubs in Kurrachee are *Ricinus communis*, *Æschynomyne Sestan*, *Parkinsonia aculeata*, and, for hedges, the milk-bush (*Euphorbia Tirucalli*), with its leafless, rush-like, flexible branches. The peepul and banyan (*Ficus religiosa* and *F. indica*), and the bheres (*Zizyphus vulgaris* and *Z. Jujuba*), are the trees planted in the avenues. On our first march from Kurrachee, about eight miles out, the Indus soil and vegetation commenced; dry creeks, dry water-furrows and a loose sandy soil, characterized by tamarisk jungle (*Tamarix gallica* and *T. dioica*) and *Salvadora persica*; low bushes of *Acacia* (*arabica*, *Catechu*), and *Mimosa* (*rubicaulis*, &c.), also abundance of the camel-thorn (*Alhagi Maurorum*). Among herbaceous plants I occasionally found a *Polygonum*, a *Gnaphalium*, a *Solanum*, &c., and above all these grows everywhere the *Capparis aphylla*, which I have told you before is also very common in Guzerat.

We passed to Tattah on the Indus, and went up the right bank as far as Hyderabad, where we crossed over to the left bank and proceeded to Rorea, which is on the side opposite to Sukkur. Before coming to Hyderabad we crossed rocky ground for some marches, where the Hala mountains come down to the river bank. Here we met with the *Euph. nereifolia* again, and two apparently new Zygo-phylloceous plants, at least I do not find them in Indian floras. On the banks of the Indus from Torrock to Sukkur grow *Ranunculus indicus*, Roxb., a *Potentilla*, and *Rumex acutus*! About Sukkur the river runs through an isolated tract of limestone hills, and the date-palm is very luxuriant, covering acres of low ground by the river; it is now in flower.

LIII.—*Botanical Notices from Spain.*

By MORITZ WILLKOMM\*.

[Continued from p. 347.]

No. XIII. SEVILLE, October 25, 1845.

AFTER a hasty visit to the unimportant Sierra de Elvira, which rises out of the middle of the plain of Granada, and is distinguished by the unusually frequent occurrence of *Chrysocome verticalis*, Lag., I

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finally took leave of Granada, and on the 20th of August set out on my journey to the kingdom of Jaen and the Sierra Morena. From the advanced season, the vegetation, especially in the lowlands, was for the most part already dried up, and the harvest was consequently much less than in the previous months. But I scarcely think, if at least I can judge from the remains of the spring flora, that this portion of Andalusia presents any very rich or rare vegetation. Only a small part of the province of Jaen belongs to Upper Andalusia; the larger portion consists of a lowland watered by the Guadalquivir, and bears throughout the character of Lower Andalusia. The most southern part of the province of Jaen is covered with a limestone range, whose loftiest chain forms a concave half-circle to the north, which stretches out from Jaen in an eastward direction as far as the frontiers of the kingdom of Murcia, and is intersected by the deep valley of the Guadiana Menor, which is formed by the rivers of Huescar, Guadix and Baza, and is the first important tributary stream which the Guadalquivir receives, as well as by the Rio de Jaen which issues from the most northern part of the Montes de Granada. By these two rivers the above-described circle of mountain-chains is divided into three parts; the central one of which appears to be the highest, and is called the Sierra de Huelma; the western one on the contrary forms the Sierra de Jaen, and the eastern one the Sierra de Cazorla. This district of steep mountains, whose greatest height can scarcely exceed 6000 feet, forms the southern limit of the immense, broad, and flat valley of the Guadalquivir, which runs from east to west through the centre of the province of Jaen. On the north this wide valley is bounded by the Sierra Morena.

As soon as the Rio Cubillas has been crossed, the traveller quits the charming road to Granada, and passing through a copse-wood of *Quercus Ilex*, soon comes to the valley of the Rio de Benalúa, which divides the Sierra del Annar, where it rises from the Sierra del Morrón,—two mountains of inconsiderable height, for the most part covered with *Lavandula Spica*, which lie between the mountain-chains of Jaen and the Montes de Granada. On grassy spots of the above-mentioned oak-wood flowered *Stellera Passerina*, L., in profusion, and also *Achillea Ageratum*, L., *Cleonia lusitanica*, L., *Echium pustulatum*, Sibth., and in the valley of the Rio de Benalúa the gigantic *Echium Lagascae*, Boiss., which I had already met with in the neighbourhood of Granada at the foot of the Sierra de Alfacar, and which occurs in all the watered valleys of the kingdom of Jaen, as well as in the plains of the Guadalquivir and the lowest valleys of the Sierra Morena in tolerable abundance. Between the villages of Calomera and Benalúa I remarked *Cynara alba*, Boiss., and *Mentha Pulegium*, L., which is extremely common on moist spots of the mountain-region throughout the whole kingdom, and especially in the Sierra Morena. Soon after passing the village of Benalúa you enter the kingdom of Jaen, and after crossing a mountain-ridge arrive at the village of Campillos de Arenas, which lies at the foot of the irregular Sierra de Arenas, which is partly wooded with pines, and is a branch of the above-described mountain-chain of Jaen. On

the rocks of this range grew luxuriantly *Sarcocapnos enneaphyllos*, DC., *Teucrium pyrenaicum*, L., var. *granatense*, Boiss., *T. Polium*, L., *T. capitatum*, L., *Silene velutina*, Pourr., *Chrysocome verticalis*, Lag., *Inula montana*, L., *Galium verticillatum*, Danth., *Scabiosa tomentosa*, Cav., *Bupleurum gibraltarium*, L., *Biscutella saxatilis*, Boiss., and on the acclivities *Plumbago europæa*, L., *Ballota hirsuta*, DC., and *Thymus tenuiflorus*, Boiss. The Sierra de Arenas is intersected by the Rio de Campillos, which further on joins the river of Jaen. The left rocky wall of this river consists of debris of laminar gypsum, and is therefore covered with a salt vegetation, among which especially occurs *Ononis crassifolia*, Duf., in abundance. Further down *Balsamita multifida*, Clem., is very plentiful.

From Jaen, where I stayed three days, I ascended the Cerro Jabalcón, one of the highest summits of the Sierra, and convinced myself in this excursion of the great sterility of this mountain-chain. The lower portion of it is covered with *Lavandula Spica*, *Phlomis purpurea*, Ph. *Lychnitis*, *Thymus tenuiflorus*, Th. *Mastichina*, *Teucrium Polium*, *T. capitatum*, *Quercus coccifera*, *Cistineæ*, &c., among which occur *Leuzea conifera*, *Chamaepeuce hispanica*, DC., *Chrysocome verticalis*, *Ruta montana*, *Inula montana*, *Crambe filiformis*, *Scabiosa tomentosa*, *Santolina rosmarinifolia*, Mill., and *Helichryson serotinum*, Boiss. On the rocks of the mountain-region grew luxuriantly *Linaria organifolia*, DC., *Silene velutina*, *Digitalis obscura*, L., *Teucrium pyrenaicum*, *Helianthemum marifolium* and *Cerastium repens*, L., which is common on the northern acclivity of the Cerro Jabalcón up to the summit. In the upper part of the mountain-chain a narrow-leaved *Iris* was still flowering on grassy slopes, and I also found here off flower, *Serratula flavescens*, Poir., *Arenaria Armeriastrum*, Boiss., *Centaurea granatensis*, Boiss., *Paeonia lobata*, Desf., *Scorzonera hispanica*, L., *Cirsium echinatum*; and on the upper face of the range *Xeranthemum erectum*, Presl, *Muscari comosum* and *racemosum*, *Silene conica*, L., *Pistorinia hispanica*, DC., and various grasses. On rocks of the summit were seen *Saxifraga spathulata*, and on the northern acclivity *Anthyllis erinacea*, *Pilotrichum spinosum*, *Salvia officinalis*, and *Odontites longiflora*, Webb. On my way back I found by a spring *Lysimachia Ephemerum*, L., and *Hypericum Caprifolium*, Boiss., and finally on perpendicular and inaccessible walls of rocks in the neighbourhood of Jaen some shrubs of *Rhus Coriaria*, L., in fruit.

On the 25th of August I quitted Jaen, and went seven leagues eastward to the town of Ubeda, which lies on the other side of the Guadalquivir below the mouth of the Guadiana Menor. The way thither leads over a hilly gypsum formation, completely destitute of trees and water, which fills up the space between the river of Jaen, the Guadalquivir, and the Sierra de Huelma, and whose vegetation, now almost wholly dried up, is similar to that of the gypsum basin of Baza. Among other plants, *Lygeum Spartum*, *Helianthemum squamatum*, *Stellera Passerina*, *Ammi Visnaga*, *Centaurea granatensis*, *C. Calcitrapa*, *Catananche lutea*, *Cleonia lusitanica*, *Momordica Elaterium*, *Crozophora tinctoria*, *Capparis spinosa*, *Atractylis cancellata*, and a number of thistles, for instance *Scolymus hispanicus*, *Sc. maculatus*,

*Silybum Marianum*, *Notobasis syriaca*, *Cynara horrida*, *Onopordon illyricum*, *Echinops strigosus* grow here luxuriantly. With this gypsum formation is connected a hilly land consisting of limestone, which possesses a rich flora and extends to the mouth of the Guadiana Menor. Here I observed *Aristolochia longa*, *Anthyllis cytisoides*, *Genista ramosissima*, *Teucrium pseudochamaepitys*, *Scabiosa stellata*, *Crucianella angustifolia*, *Leuzea conifera*, *Atractylis humilis*, *Linum suffruticosum*, *Coris monspeliensis*, *Campanula Erinus*, *Minuartia montana* and *Elæoselinum Lagasæ*, Boiss., in fruit. The banks of the Guadalquivir are for the most part bordered by oleander, pistachio, and tamarisk bushes, beneath which *Cynanchum monspeliacum*, L., occurs in tolerable plenty. The right bank of the Guadalquivir consists of alluvial soil, which in the country around the towns of Baëza and Ubeda is partly planted with vines and olives. In the environs of both places occur *Ammi Visnaga*, L., in immense quantities, and on dry spots between Ubeda and the river the pretty *Heliotropium supinum*, L., in company with *Crozophora tinctoria* and *Momordica Elaterium*.

I now turn to the vegetation of the Sierra Morena, whither I journeyed from Ubeda, and which I have traversed in its full extent from the limits of Murcia as far as the frontiers of Portugal and to the mouth of the Guadiana, a distance of sixty-two German miles. I know no mountain-chain in Spain, which, in such a length and breadth (the average breadth may be taken at least at eight German miles), possesses such an immense uniform vegetation, but which differs in the different formations. I therefore consider it necessary to give first of all a brief geognostical survey, before proceeding to the general characteristics of the vegetation in the Sierra Morena. The Sierra Morena is of no great height, its highest point scarcely reaching 5000 feet, and that of its broad and greater portion only 2-3000 feet. It is distinguished by its peculiar character, as well as by its thick forests, from all the other mountain-chains of Andalusia, whose northern limits it forms, while it covers a large portion of the provinces of Jaen, Cordoba, Seville, and Huelva. Before I pass to the geognostical description of this mountain-chain, it may be well to give briefly my route over it.

From Ubeda I went in a north-easterly direction to the village of San Esteban del Puerto, which lies near the frontiers of Murcia, and from hence north-east to the Venta de Cardenas on the road to Madrid, close to the limits of the Mancha, upon which I went southwards through the Puerto de Despeñaperros to Carolina. After a stay of several days in this city I journeyed on, following the road to Andujar, and then went down the valley of the Guadalquivir to Montoro, where this river intersects the lowest part of the Sierra Morena, and enters the lowlands of the province of Cordoba. From Montoro I again turned northwards into the mountain-chain as far as Villanueva de Cordoba, from whence I travelled in a north-easterly direction towards the baths of Fuencaiente in the Mancha. From thence I went westwards to the little town of Pozo-Blanco, and then through the whole of the Sierra in a south-westerly direction

to Villaharta and Cordoba. After a residence of a fortnight in this town, I again crossed the whole mountain-chain and went northwards to Almada in the Mancha, then turned back again into the province of Cordoba, and journeyed south-west through Hinojosa to the little mountain-town of Fuente Ovejuna, and from hence westwards to Estremadura, which however I very soon quitted to enter the province of Seville. From the mountain-town of Guadalcanal, I turned westwards, and journeyed through the most mountainous portion of the Sierra Morena to the little town of Aracena, only five leagues from the frontiers of Portugal, where the Sierra Morena divides into two principal branches, one of which follows the chief direction, and stretches away far into Portugal, and the other goes off in an almost southerly direction as far as the Atlantic, covers the greatest portion of the province of Huelva, and forms the left wall of the valley watered by the Guadiana. Through this southern and very broad branch, I journeyed from Aracena through Cerro and Villanueva de los Castillejos to the mouth of the Guadiana.

The chief portion of the whole of the Sierra Morena consists of graywacke, which crops out in part as a compact rock, partly as graywacke schist, which takes an endless variety of forms according to its consistence and colour. In isolated spots this stone alternates with clay-schist, as at Almada, where it forms the matrix of the celebrated quicksilver ores, and between Villaharta and Fuente Ovejuna, where recently very rich coal-mines have been discovered. This graywacke formation stretches from Murcia as far as Portugal and up to the Guadiana, is from four to six German miles in extent, and forms uniform, undulating, gently rounded mountains and ridges, which in a great portion of the chain scarcely attain the height of 3000 feet. Only in the most western portion, in the province of Huelva, in the environs of Aracena, this formation consists of rugged and loftier mountains, which may perhaps be from 3-4000 feet high. Here the graywacke is in many places interrupted by a gneiss formation, which probably also constitutes the most northern chains of the western portion of the Sierra Morena, lying in Lower Estremadura, for this part is much more watered than the central and eastern part of the mountain-chain. Along the southern foot of the Sierra Morena various other formations overlie the graywacke, namely in the east of Murcia, as far as the country of Carolina, a red, very soft and clayey sandstone, which forms long, horizontal, but steep ridges. To this is joined a large formation of red, very hard and fine *Schleifstein*, which covers the whole southern margin of the mountain-chain of Baylen as far as beyond Montoro, forms somewhat steep, cup-formed or pyramidal, but neither rocky nor lofty, mountains, and passes into a white sandstone, which extends from Cordoba westward to the foot of the Sierra Morena. In the central part of the Sierra Morena, that is to say in the province of Cordoba, an immense granite formation breaks through the graywacke, which however forms no isolated summits, but an immense undulating table-land sloping gently towards the north, and lying between the northern margin of the graywacke formation and the lofty mountain-

chains which divide the province of Cordoba from Estremadura and the Mancha, but still belong to the Sierra Morena. In this somewhat barren granite plain lie the towns of Pozo-Blanco and Hinojosa, as well as a number of smaller places, for this part of the mountain-chain is the most populated of all. At the baths of Fuencaliente, much frequented on account of their hot mineral springs, begins a mountain-chain consisting of several parallel chains, which is distinguishable from a distance by its rugged, very rocky summits, and stretches out in a north-western direction to beyond Almadea, where it is divided by the valley of the Rio Zuja, a tributary of the Guadiana, from another similarly formed mountain-chain which goes in a south-westerly direction from the Zuja into the country of La Granja in Estremadura, where it joins the graywacke chains of Fuente Ovejuna. Both chains bound the above-mentioned granite plain on the north-west and east, and consist of a peculiar white stone, very hard and rich in quartz, which the Spaniards call Arenisca Cuarzosa (quartzose sandstone, but it is no true sandstone). This formation constitutes the highest mountains of the entire Sierra Morena.

The vegetation of all these formations consists indeed, in their principal features, of the same plants, but their distribution varies remarkably in the different formations. Moreover almost every formation possesses a number of plants peculiar to itself. To speak generally, the flora of these formations is throughout the whole mountain-range the same; only in the western part a decided tendency to the western flora of the peninsula of the Pyrenees is observable, as here a number of plants occur which are peculiar to Portugal and Western Andalusia. The chief part of the vegetation of the Sierra Morena is formed of trees and shrubs; the herbaceous vegetation is limited to a spring flora, as on account of the slight elevation of this mountain-chain, the greatest part of these plants are parched up from the month of July. Not until the autumn does the herbaceous vegetation spring up anew, and then brings forth a number of bulbous plants, very uniformly distributed over the whole range, as *Squilla maritima*, Steinhl., *Scilla autumnalis*, L., *Leucojum autumnale*, L., *Merendera Bulbocodium*, Ker., and *Narcissus serotinus*, L., which last however only occurs in the southern part of the above-mentioned chain, which stretches from Aracena southwards as far as the sea. In the spring the whole of this range must present a very variegated appearance, from the numerous flowering *Cistineæ*, *Leguminosæ*, *Labiatae* and *Compositæ*, and in this season some new discoveries may also perhaps be made in the families of the *Liliaceæ* and *Orchideæ*, for the other herbaceous plants are, to judge from the remains of the parched-up vegetation, common plants in the south of Spain. I now proceed to a description of the vegetation in the various formations.

1. *Graywacke formation*.—This is entirely covered with a very thick 'monte bajo,' which, especially on the northern and eastern acclivities of the river-valley, is extremely luxuriant. The principal part of this shrub-vegetation is formed of the noble *Cistus ladaniferus*, L., which overspreads the Sierra Morena for a length of some fifty

German miles, and covers frequently whole square miles *exclusively*. Next to this *Cistus* occurs most plentifully *Phillyrea angustifolia*, L., *Rosmarinus officinalis*, L., and *Helianthemum glutinosum*?, less frequent *Adenocarpus Telonensis*, Gay, *Cistus crispus*, *C. albidus*, *C. monspeliensis*, *Erica arborea*, *Genista ramosissima*, *Daphne Gnidium*, *Pistacia Terebinthus* and others. On the northern and eastern slopes of the valleys occurs especially *Arbutus Unedo*, L., and on the banks of the rivulets and rivers *Nerium Oleander*, *Pistacia Lentiscus*, *Salix cinerea*, L., *Rosa canina* and *Rubi*, interlaced with wild vines. Of trees, there grow luxuriantly on this formation and very plentifully, *Quercus Ilex*, *Qu. Ballota*, the first most frequently of shrubby growth, and in the eastern part of the mountain-chain *Qu. Suber*. The following are to be regarded as trees peculiar to this formation: *Fraxinus excelsior*, L., *Acer monspessulanum*, L., and *Alnus glutinosa*, L., which however occur only in the deep river-valleys, as for example in the valley of the Rio Magaña which runs through the Puerto de Despeñaperros, in the valleys of the Rio Cuzua and Guadabarbo in the province of Cordoba, and in the valleys of the Cala Ribera, Huelva Ribera and Rio Tinto in the province of Huelva:—in addition, *Phillyrea media*, L., which I have met with only in two places in the valley of the Guadalea, between S. Estaban del Puerto and Aldea Quemada, and in the valley of the Huelva Ribera. Of shrubby plants, *Cistus laurifolius*, L., and *Helianthemum atriplicifolium*, W., which occur between the two river-valleys of the Cuzua and Guadabarbo, alone appear to be peculiar to this formation. Finally the graywacke formation possesses a portion of herbaceous plants, mostly rock-plants, as for example *Digitalis Mariana*, Boiss., clearly distinguished by its white woolly leaves and other characters from *D. purpurea*, and *Brassica longirostris*, Boiss., which grow luxuriantly on almost all the rocks of this formation, but most frequently and abundantly on the colossal rocks of the celebrated Puerto de Despeñaperros. Here occur moreover *Jasione foliosa*, Cav., forming thick beds, *J. montana*, L., *Umbilicus hispidus*, DC., *U. pendulinus*, DC., *Sedum amplexicaule*, DC., *Trixago Apula*, *Erysimum canescens*, Roth., *Lychnis dioica*, L., two pinks, one with capitate flowers, *Phagnalon Lagasca*, DC., *Rumex pulcher*, L., *Poterium mauritanicum*, Boiss., *Campanula Rapunculus*, L., *Ruscus aculeatus*, L., *Geranium lucidum*, L., &c. In addition throughout the eastern and central graywacke chain occurs very frequent the pretty *Eryngium tenue*, Lam., which was apparently already off flower, as most of the above-named rock-plants had long been. On the margins of streams I observed frequent *Hypericum baticum*, Boiss., and *H. perforatum*, L.

2. *Granite formation*.—This is characterized by its extraordinary sterility, and is covered partly with extensive forests of *Quercus Ilex* and *Qu. Ballota*, partly with a very poor and sparing underwood, for the most part of shrubby *Qu. Ilex*, mingled with *Cistus ladaniferus*, *Phillyrea angustifolia* and *Arbutus Unedo*. Characteristic of this formation are *Retama sphaerocarpa*, Boiss., and a *Pyrus* (*P. eriopleura*? Rehb.). In the environs of the numerous villages lying in this barren and dry high table-land I observed *Verbena supina*, Clus.,

and *Xanthium spinosum*, L., in plenty, less frequent *Heliotropium supinum*, L., and in vineyards about the hamlet El Viso de los Pedroches, the pretty *Cleome violacea*, L., still in flower.

3. *Sand and Schleifstein formation*.—This is characterized by an unusually luxuriant and variously composed shrubby vegetation, which is however in the *Schleifstein* and white sandstone formation richer in trees than in the eastern red sandstone formation, and, especially in the country of Cordoba, frequently alternating with copes of *Pinus Pinea*, L. Here occurs also *Quercus Suber* plentifully, and also *Qu. Ilex* and *Qu. Ballota*. The underwood consists especially of *Qu. pseudococcifera*, Desf., *Qu. lusitanica a. faginea*, *Olea europæa* var. *sylvestris*, *Viburnum Tinus* and *Myrtus communis*, and also almost all the shrubs of the graywacke formation, especially *C. ladaniferus*, but variously intermixed.

4. *Arenisca quarzosa*.—The above-described most northern mountain-chains of the Sierra Morena are also for the most part covered with shrubs, which are very varied and characterized by the occurrence of *Cistus populifolius*, L., and a shrubby *Helianthemum*, which resembles the *H. halimifolium*, L., but is clearly distinguished from it by numerous smaller and channeled leaves. In this formation is also found *Cratægus monogyna* in great profusion. I have not observed any trees in this part of the mountain-chain, with the exception of *Qu. Ilex* and *Qu. Ballota*. On the rocks a *Jasione* is plentiful, forming beds; it seems to be different from *J. foliosa*, Cav., but unfortunately was already quite dried up.

5. *Most Western part of the Sierra Morena*.—Although this for the most part consists of graywacke, its vegetation is very different from that of the rest of the graywacke range, and its underwood extremely varied, on which account I must speak here particularly of this division of the mountain-chain. *C. ladaniferus* still continues to form the chief portion of the shrubby vegetation, which occupies large tracts as far as the sea; but besides this occur *C. populifolius*, L., and almost all the shrubs of the above-described formations in abundance, as well as all the trees, especially *Qu. Suber*, which forms large woods with *Qu. Ballota* and *Pinus Pinea*, L. Of shrubs, which I had not before observed in the other parts of the mountain-chain, I found *Helianthemum halimifolium*, L., (the *Helianthemum* mentioned in the preceding formation also occurs here and there,) *Teucrium fruticans*, L., *Erica umbellata*, L., and lastly two shrubs peculiar to the south-west of Andalusia and Portugal in great plenty, namely *Genista tridentata*, L., and *Ulex genistoides*, Brot. At Villanueva de los Castillejos our common *Calluna vulgaris* is plentiful, and was just in full flower.

In moist lowlands, throughout the whole range, but especially in the eastern and central part, occurs a thorny shrub with virgate branches and small elliptical coriaceous leaves, in very great abundance, which appears to belong to the *Rhamnaceæ* (I have found neither flowers nor fruit), as well as *Mentha Pulegium*, *M. rotundifolia*, a *Senecio*, and a *Pulicaria* with very small heads of flowers. On clayey soil, especially of the granite formation, *Tanacetum annuum*,



L., was now in flower in great plenty, wholly covering large tracts of land, and in the oak-woods grew luxuriantly *Cynara horrida*, and *C. humilis*, DC., very frequent. The last occur quite as numerous in the plains of the Guadalquivir, of which I will now say a few words. The banks of the Guadalquivir, from Andujar to Seville and further down, are for the most part lined with *Tamarix gallica*, L., *Ricinus communis*, L., *Xanthium spinosum*, L., *X. Strumarium*, L., and various *Chenopodiaceæ*. At Montoro and Cordoba, *Salsola rosacea* occurs plentifully; and at Montoro and Seville, here and there, *Vitex Agnus-castus*, L. The following plants are common in this flat land: *Ammi Visnaga*, L., *Scolymus maculatus*, Sc. *hispanicus*, *Notobasis syriaca*, *Silybum Marianum*, *Centaurea Calcitrapa*, *Datura Stramonium*, *Atractylis gummifera*, L., and rare *Verbena supina* and *Heliotropium supinum*. In the environs of Cordoba, at the foot of the Sierra Morena, grow luxuriantly and in tolerable abundance *Paliurus australis*, L., *Asparagus horridus*, L., and, on the contrary, rare, *Anagallis verticillata*, All.

The graywacke formation of the Sierra Morena approaches within four miles of the coast in the south-western part of the province of Huelva, where a very intersected low hilly land, consisting of limestone debris, breccia and gravel overlies it, covering the coast from the mouth of the Guadiana as far as the mouth of the Rio Piédra at the little town of Cartaya, and is tolerably thickly wooded with pines (*Pinus Pinca*). In its underwood occurs *Cistus ladaniferus*, still very frequent, and also great quantities of *Ulex genistoides*, Brot., *Calluna vulgaris*, and a leafless prickly *Genista*. Pine-forests border this hilly land, which include the sandy coast of Cartaya up to the mouth of the Guadalquivir, and, as I before observed, descend far toward the coast of the province of Cadiz eastwards. The banks of the Guadiana, both Spanish and Portuguese, and the coast of the mouth of this noble stream as far as Huelva, are bordered with immense marismas or morasses, which have the same vegetation as the before-described morasses of the Isla de Leon and of Chiclana, and whose plants were now partly in flower. The chief portion of this saline marshy vegetation consists of a number of *Salsolaceæ*, as *Salsola Kali*, L., *S. sativa*, L., *Salicornia fruticosa*, L., and others; moreover, *Obione portulacoides*, Moq., *Frankenia thymifolia*, and especially a large shrubby *Statice* with fleshy lanceolate leaves and red flowers, and a *Senecio* with fleshy cylindrical leaves. Everywhere on the hedges and walls around Agamonte and Huelva blossomed *Atriplex Halimus*, L., with other *Chenopodiaceæ*. Huelva, the chief town of the province, lies on a tongue of land between two arms of the sea, stretching inland for several miles, at the foot of a height consisting of mere loam and sand, on which *Salsola microphylla*, Cav., occurs very plentifully. The banks of these two arms of the sea are also occupied by immense morasses, which present the same vegetation as the before-described marismas.

On the 10th of October I left Huelva and the next day reached Seville, whither the road leads through an uninterrupted lowland, which in part is extremely well cultivated, especially from Palma.

The road frequently leads through copses of cork-trees and pines, and large barren tracts are seen covered with *Chamærops humilis*. *Narcissus serotinus*, L., *Scilla autumnalis*, L., *Leucogon autumnale*, *Squilla maritima*, *Ranunculus bullatus* and *Melissa Calamintha* flowered everywhere in this lowland; more rarely *Merendera Bulbocodium* and *Mandragora officinarum*. The most interesting plant which presented itself on this road was the *Pancreatium humile*, Cav., or *Carenosia lutea*, Boiss., still so seldom found in herbariums, which hitherto was only known in one locality at Seville, where it occurs rarely, and in another at the Puerto de St. Maria. This lovely and sweet-smelling plant grows luxuriantly and very frequent in the plains of the province of Huelva, where I have observed it from Cartaya to within a few leagues of Seville, and is on some spots, as for example in the environs of the village of Niebla, extremely common.

The environs of Seville present at this season scarcely anything beside the common autumnal flora of the plains of Lower Andalusia.

#### BIBLIOGRAPHICAL NOTICES.

*Phycologia Britannica: or a History of British Sea-weeds, containing Coloured Figures, Generic and Specific Characters, Synonymes, and Descriptions of all the species of Algæ inhabiting the Shores of the British Islands.* By WILLIAM HENRY HARVEY, M.D., M.R.I.A., Keeper of the Herbarium of the University of Dublin.

As great admirers of that beautiful portion of our flora, the subjects of which, even more than those of the land, are "born to blush unseen," we hail with extreme pleasure an illustrated 'History of British Sea-weeds.' And above all—on account of the accuracy it insures—one, in which every species inhabiting the shores of the British Islands will be drawn, lithographed and described by the same hand. The importance of this combination in the one individual is well known to all naturalists who have had any experience; the species being generally described by one party, drawn by a second, and engraved by a third:—and truly may we say, that "small by degrees and *beautifully* less" in accuracy is sure to be their fate the more hands they pass through.

This work is published in royal octavo, to admit of as many species as possible being figured of full natural size; when this cannot be done, a double plate will occasionally appear; and of the giants of the deep, a portion will be given of natural size; when the species are minute, two will be represented on the same plate, as we already see done in the *Elachistea*, seven species being thus figured in the one number instead of six, as announced in the prospectus. In every instance microscopical representations of the structure, fructification, &c. will appear, and all will be coloured.

The descriptive portion will be much more full than in any previous work in which our native plants have been treated of, for the 'Phycologia Britannica' will as a whole occupy a place by itself. We have ample descriptions of the species; their geographical dis-